

## PATENT ABSTRACTS OF JAPAN

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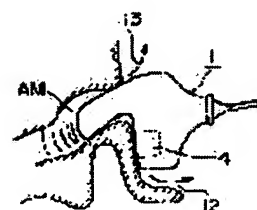
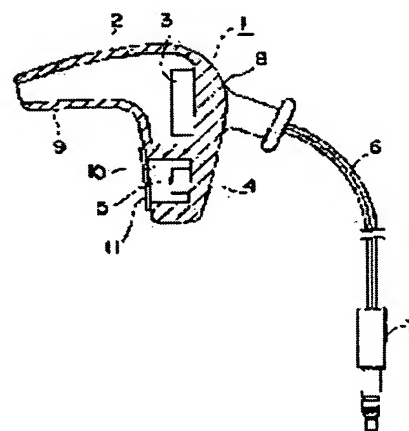
SAKURAI KAZUO

## (54) EARPHONE WITH MICROPHONE

## (57)Abstract:

PURPOSE: To enable the listening of a clear conversation without generating howling by mounting the opening part for collecting sound of a microphone storage part so as to set apart from a human body a little and to face the human body when a main body is inserted into the ear.

CONSTITUTION: This earphone is composed of a main body 2 which is inserted into the external auditory miatus of a person putting on the earphone and is supported, a speaker 3 which is arranged in this main body 2, a microphone storage part 4 mounted in this main body 2 and a microphone 5 arranged in this microphone storage part 4. By arranging the opening part 10 for collecting sound of the microphone storage part 4 at the location opposed to a sound route part 9 in the main body 2, an earphone 1 with microphone is put on by a person. When the main body 2 is inserted into the external auditory miatus AM, the opening part 10 for collecting sound of the microphone storage part 4 is located so as to face a human body or the vicinity of the anti ragns of the ear by leaving slight space. The sound by the bone vibration of the human body and a human voice are synthesized and are supplied to the microphone 5 via the opening part 10 for collecting sound.



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## LEGAL STATUS

[Date of request for examination]

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## CLAIMS

[Claim(s)]

[Claim 1] The body inserted in concha auriculæ, external auditory meatus, or its both sides, and the loudspeaker arranged into this body, It consists of a microphone arranged all over the microphone stowage attached in said body, and this microphone stowage. The earphone with a microphone characterized by attaching and becoming so that opening for sound-collecting of a microphone stowage may leave a few on the body and may meet it, when said microphone stowage is inserted in this body by concha auriculæ, external auditory meatus, or its both sides to said body.

[Claim 2] The earphone with a microphone according to claim 1 which a body is inserted in concha auriculæ, external auditory meatus, or its both sides, and is supported.

[Claim 3] The earphone with a microphone according to claim 1 which secured the condition that opening for sound-collecting of a microphone stowage \*\*\*\*\* (ed) on the body for a while, and met it by arranging a sound-penetrating material on opening for sound-collecting of a microphone stowage.

[Claim 4] Furthermore, the earphone with a microphone according to claim 1 which has the electrical circuit section which consists of a phase comparator, amplifier, and a band pass filter.

[Claim 5] The earphone with a microphone according to claim 4 which has the electrical circuit section in the body.

[Claim 6] Furthermore, the earphone with a microphone according to claim 4 which is equipped with a code and a plug and has the electrical circuit section in said plug.

[Claim 7] The earphone with a microphone according to claim 1 to 4 with which a body consists of the tubed sound path section ahead prolonged from approximate circle board-like a loudspeaker stowage and this loudspeaker stowage.

[Claim 8] The earphone with a microphone according to claim 7 with which the microphone stowage is directly attached in the body.

[Claim 9] The earphone with a microphone according to claim 7 with which the microphone stowage is constituted in the body.

[Claim 10] The earphone with a microphone according to claim 7 with which the side-face configuration of a body has become \*\*\*\*-like of V characters by the sound path section of a body carrying out eccentricity to a loudspeaker stowage, and being unified with a proper include angle.

[Claim 11] The earphone with a microphone according to claim 10 with which the microphone stowage is built in the location where it counters with said sound path section in a body while the sound path section of a body is unified toward the inside from the circumference neighborhood of a loudspeaker stowage.

[Claim 12] The earphone with a microphone according to claim 11 with which opening for sound-collecting of a microphone stowage is located near [ intertragic-notch ] a wearing person when equipped.

[Claim 13] The earphone with a microphone according to claim 1 to 4 with which a body consists of an approximate circle board-like loudspeaker stowage and a rod-shaped part prolonged from this loudspeaker stowage back, and the microphone stowage is attached through this rod-shaped part.

[Claim 14] The earphone with a microphone according to claim 7 whose microphone stowage is a lever-like thing.

[Claim 15] The earphone with a microphone according to claim 14 with which opening for sound-collecting of a microphone stowage is located in a wearing person's cheek upper part when equipped.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] Moreover, this invention relates to the earphone with a microphone which can hear a clear conversation etc., without causing a howling in more detail about an earphone with a microphone.

[0002]

[Description of the Prior Art] In case the earphone is used widely, it can equip with this earphone as a means for winning popularity, without conventionally the voice transmitted by the third person being heard by others so that it may not be conspicuous from the outside, since it is easy to manufacture a small thing, therefore a policeman receives a command, it is common knowledge to use it with the walkie-talkie.

[0003] Although a microphone may naturally be used and the microphone is connected and used for the walkie-talkie in current since it is necessary to check a command, from a viewpoint that it is more desirable not to be conspicuous, it is especially possible to build this microphone into an earphone with the above examples.

[0004]

[Problem(s) to be Solved by the Invention] However, although it is understood easily, since the so-called howling occurs when a microphone is built into an earphone, it is thought whether the product which can be equal to practical use can be offered, and the earphone which incorporated the above microphones also in fact is not developed.

[0005] In order to solve the above problems, introducing the technique of a bone conduction microphone is also considered, but when this bone electric microphone is used, audio plainness will be lost, and if it is conversation, another problem that whose voice will be able to be heard similarly will be produced.

[0006] Therefore, the purpose of this invention is to offer the earphone with a microphone which can hear a clear conversation etc. moreover, without causing a howling.

[0007]

[Means for Solving the Problem] The configuration of the earphone with a microphone which this invention adopted in order to attain the above-mentioned purpose The body inserted in a turbinated body, external auditory meatus, or its both sides, and the loudspeaker arranged into this body, It consists of a microphone arranged all over the microphone stowage attached in said body, and this microphone stowage. When said microphone stowage is inserted in this body by concha auriculae, external auditory meatus, or its both sides to said body, it is characterized by attaching and becoming so that opening for sound-collecting of a microphone stowage may \*\*\*\*\* on the body for a while and may meet it.

[0008] Hereafter, drawing explains this invention to a detail.

[0009] Drawing 1 is what showed the earphone 1 with a microphone which is an example of operation of this invention, and this earphone 1 with a microphone consists of a microphone 5 arranged all over the body 2 which is inserted in a wearing person's external auditory meatus, and is supported, the loudspeaker 3 arranged into this body 2, the microphone stowage 4 attached into this body 2, and this microphone stowage 4. In addition, 6 is a code and 7 is a plug.

[0010] Although it is fabricated in this example by one with proper elasticity resin in order to make effect of vibration of a loudspeaker 3 hard for the above-mentioned microphone stowage 4 to constitute some bodies 2, and to be influenced, this invention may be a member with separate body 2 and microphone stowage 4 like other examples which it is not limited in this way and mentioned later.

[0011] A body 2 consists of the tubed sound path section 9 prolonged ahead (left in drawing) from the almost disc-like loudspeaker stowage 8 and this loudspeaker stowage, and the side-face configuration of a body 2 has become \*\*\*\*-like of V characters the sound path section 9 carrying out eccentricity to a loudspeaker stowage, and being unified with a proper include angle, i.e., by unifying the sound path section 9 toward the inside from the circumference neighborhood of the loudspeaker stowage 8.

[0012] If it is generally used as a loudspeaker contained by the above-mentioned loudspeaker stowage 8, building in an earphone, you may be what kind of format and it will not be restricted especially.

[0013] Although similarly there is especially no limit also about the microphone 5 arranged all

over the microphone stowage 4, an electret type thing is desirable.

[0014] By allotting the location which \*\* and counters by this invention with the microphone stowage 4 and said sound path section [ in / it divides, and the description is in arrangement of the opening 10 for sound-collecting, namely, / for the opening 10 for sound-collecting of the microphone stowage 4 / a body 2 ] 9 As shown in drawing 2 , a wearer wears the earphone 1 with a microphone of this invention. When a body 2 is inserted in external auditory meatus AM, it has positioned so that the opening 10 for sound-collecting of the microphone stowage 4 may vacate spacing for the body and a concrete target slightly to the intertragic-notch neighborhood of a lug and may meet.

[0015] In order to position the opening 10 for sound-collecting of the microphone stowage 4 as mentioned above Although you may carry out by adjusting the size of a body 2 to dimensions, such as concha auriculæ in human being's lug, or external auditory meatus, using there being no individual difference so much, simpler As opposed to the opening 10 for sound-collecting of the microphone stowage 4 For example, a nonwoven fabric, What is necessary is to apply the covering 11 by sound-penetrating materials, such as a synthetic fiber or sponge, and just to enable it to secure the above-mentioned spacing, even if the earphone with a microphone of this invention moves while in use and the opening 10 for sound-collecting of the microphone stowage 4 is forced on the body.

[0016] A wearer wears the earphone 1 with a microphone of constituting as mentioned above, i.e., this invention. By positioning so that the opening 10 for sound-collecting of the microphone stowage 4 may vacate spacing slightly and may meet to the body, when a body 2 is inserted in external auditory meatus AM Since the sound by bone vibration of the body and the voice from opening are compounded and supplied to a microphone 5 through the opening 10 for sound-collecting, a clear conversation is attained.

[0017] moreover, the direction which goes to the microphone stowage 4 of the leakage sounds 12 and 13 which will reflect and return within about [ that the sound-collecting operation by concha auriculæ is expectable ] and external auditory meatus if the side-face configuration adopts as a body 2 what is \*\*\*\*-like of V characters like the above-mentioned example -- intercepting -- the omission from the lug of about [ that a howling can be prevented more effectively ] and a wearing person -- prevention -- things are made.

[0018] the phase correction of a frequency component which consists of a phase comparator, amplifier, and a band pass filter, and is easy to carry out a howling as shown in drawing 3 in order to enable still clearer conversation by this invention on the other hand and to prevent a howling -- \*\* -- sound-volume amendment can be performed and the electrical circuit section 14 which gives clear tone quality can also be adopted by reducing a still more unnecessary frequency component.

[0019] In addition, even if it makes the above-mentioned electrical circuit section 14 build in in

a body 2, it may be made to build in in a plug and is good also as another object.

[0020] Drawing 4 is what showed the earphone 15 with a microphone which is example of another of operation of this invention. This earphone 1 with a microphone The body 16 which is inserted in a wearing person's external auditory meatus like the thing of the above-mentioned example, and is supported, It consists of a microphone (not shown) arranged all over the tip of the loudspeaker (not shown) arranged into this body 16, the microphone stowage 17 of the shape of a lever attached in this body 16, and this microphone stowage 17.

[0021] A body 16 consists of a disc-like loudspeaker stowage 18 and a rod-shaped part 19 prolonged from this loudspeaker stowage back in example of another of this operation. Although the opening 20 for sound-collecting of the microphone stowage 17 is different from the earphone with a microphone of the above-mentioned example in that it is located in a wearing person's cheek upper part through the covering 20 by the sound-penetrating material when the microphone stowage 17 is attached through this rod-shaped part 19, therefore it is equipped It is the same except it.

[0022] While the howling was effectively prevented in the earphones 1 and 15 with a microphone of this invention constituted as mentioned above, listening of a clear conversation etc. was possible.

[0023]

[Function and Effect of the Invention] The body with which that of the earphone with a microphone of this invention is inserted in a turbinated body, external auditory meatus, or its both sides, The loudspeaker arranged into this body, and the microphone stowage attached in said body, Consist of a microphone arranged all over this microphone stowage, and said body is received in said microphone stowage. Listening of a conversation clear moreover etc. is possible, without causing a howling, since it attaches and becomes so that opening for sound-collecting of a microphone stowage may \*\*\*\*\* on the body for a while and may meet it when this body is inserted in concha auriculæ, external auditory meatus, or its both sides.

[0024] And it can be called the outstanding thing that a miniaturization and lightweight-izing are possible and it is rare to give a wearing person fatigue.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the side elevation which made the cross section a part of example of operation of this invention.

[Drawing 2] It is the side elevation which made \*\*\*\* the cross section for the case where it equips with that of an example of operation of this invention.

[Drawing 3] It is the circuit diagram of the electrical circuit section used by that of this invention.

[Drawing 4] It is the front view of example of another of operation of this invention.

[Description of Notations]

1 Earphone with Microphone

2 Body

3 Loudspeaker

4 Microphone Stowage

5 Microphone

10 Opening for Sound-collecting

11 Covering

15 Earphone with Microphone

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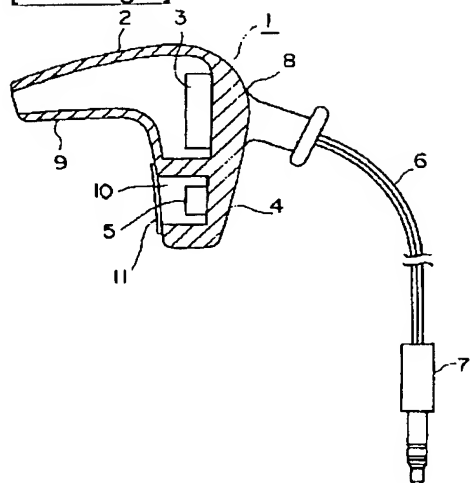
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## DRAWINGS

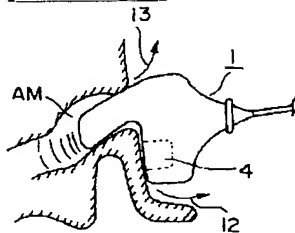
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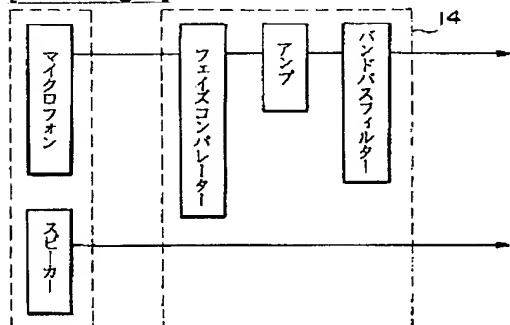
[Drawing 1]



[Drawing 2]

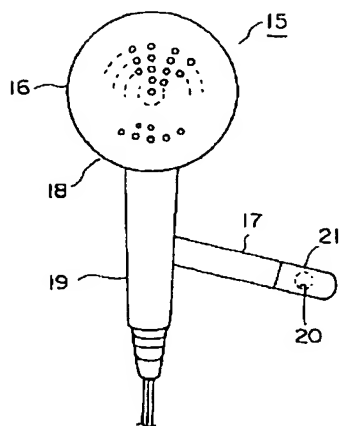


[Drawing 3]



[Drawing 4]





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